WHAT IS CLAIMED IS:

1. A mesh structure disposed between a plurality of anode units and cathode units of a tetraode field emission display, comprising:

a first conductive layer to serve as a converging electrode layer having a proximal surface facing the anode units and a distal surface opposing to the proximal surface, the first conductive plate comprising a plurality of first apertures extending therethrough;

a glass plate formed on the proximal surface of the first conductive layer to serve as a spacer, the glass plate including a plurality of second apertures extending therethrough;

an insulation layer formed on the distal surface of the first conductive layer; and

a second conductive layer formed on the insulation layer to serve as a gate electrode layer, the second conductive layer having a proximal surface facing the cathode units and a distal surface opposing to the proximal surface, wherein the second conductive layer includes a plurality of third apertures extending therethrough and aligned with the first and second apertures.

2. The mesh structure of Claim 1, wherein each second aperture is aligned with one corresponding first aperture.

3. The mesh structure of Claim 1, wherein each second aperture covers an opening range of a plurality of the first apertures.

4. The mesh structure of Claim 1, wherein each third aperture is aligned with one corresponding first aperture.

5. The mesh structure of Claim 1, wherein each third aperture covers an opening range of a plurality of the first apertures.

6. The mesh structure of Claim 1, wherein the insulation layer is a glass glue.

7. A mesh structure of a tetra-polar field-emission display, comprising:

a converging electrode layer having an array of first apertures extending therethrough;

a spacing glass plate located adjacent to one side of the converging electrode layer, the insulation layer having a plurality of second apertures aligned with the first apertures;

an insulation layer formed on the other side of the converging electrode layer; and

a gate layer including a plurality of conductive lines located adjacent to the insulation layer, wherein each of the conductive lines is aligned with a portion of the converging electrode layer between one pair of neighboring rows of the first apertures.

8. The mesh structure of Claim 7, wherein the gate layer further comprises a hollow frame within which the conductive lines extend.

9. The mesh structure of Claim 7, wherein each of the second apertures is aligned with one corresponding first aperture.

10. The mesh structure of Claim 7, wherein each of the second apertures is aligned with a plurality of corresponding first apertures.

11. A method of fabricating a mesh structure mounted between an anode plate and a cathode plate of a tetra-polar field-emission display, comprising:

providing a first conductive plate;

forming a plurality of first apertures extending through the first conductive plate;

providing a glass plate to server as a spacer;

forming a plurality of second apertures extending through the glass plate;

temporally attaching the glass plate to one side of the first conductive plate with the second apertures aligned with the first apertures;

providing an insulation layer formed on the other side of the first conductive plate;

providing a second conductive plate;

forming a plurality of third apertures extending through the second conductive plate;

temporally attaching the second conductive plate to the insulation layer with the third apertures aligned with the first and second apertures; and

permanently stacking the glass plate, the first conductive plate, the insulation plate and the second conductive plate to form the mesh structure.

12. The method of Claim 11, wherein the step of temporally attaching the glass plate to the first conductive plate includes applying an ultra-violet glue therebetween.

13. The method of Claim 11, wherein the step of temporally attaching the second conductive plate to the insulation layer includes applying an ultra-violet glue therebetween.

14. The method of Claim 11, wherein the step of permanently stacking the glass plate, the first conductive plate, the insulation plate and the second conductive plate includes a high-temperature sintering process.

15. The method of Claim 11, further comprising providing the first and second conductive layer fabricated from a material having a thermal expansion coefficient similar to that of the anode plate and the cathode plate.

16. The method of Claim 11, further comprising providing the glass plate having a thermal expansion coefficient similar to that of the anode plate and the cathode plate.

17. The method of Claim 11, wherein the insulation layer is a glass glue.